RETURN ON CAPITAL INVESTMENT AND TRANSFER PRICING; TWO SIGNIFICANT MEASURES OF DIVISIONAL PERFORMANCE

by

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CHAPTER I

INTRODUCTION

The application of computers in the business world, particularly the more recent utilization with integrated systems to replace the collection of quasi-independent functional departments as we have had for so many years, has caused many writers to predict the demise of much of what we refer to as middle management. Perhaps even more earth shaking, they also predict the reverse of the popular trend toward further decentralization of our burgeoning industries.

Availability of accurate and timely data is making possible the routinization of many decisions heretofor made by the middle manager to the extent that these data can be programmed into a computerized operation. Middle and lower level management is thus relieved of much of its reason for existence. Further, top management is finding that it is no longer necessary to wade through voluminous reports to husband the organization for which it has assumed responsibility for success. The operation can be scrutinized with considerably more precision. In fact, higher management will find it now has the means at its disposal to more directly and personally control the operation. The need for multiple layers of management is waning.

Leavitt and Whisler refer to this processing of large amounts of information by computer with the related application of statistical and mathematical methods for solving decision-making problems as information

technology.[1] This information technology will permit top management to extend its thinking range by permitting more information to be organized more simply and more rapidly. Top management can thus act on a wider range of problems and extend its control over subordinates' decision making process. They point out that decentralization has been largely negatively motivated in that management has only backed into it because of being unable to keep up with size andtechnology. Since top management now has the means as well as the will to effectively control larger segments of an operation, at least a few writers predict a reversion to centralization. However, there remains disagreement as can be expected with any such relatively new concept.

For example, John Burlingame concludes . . . "that decentralization and the middle manager are much more likely to grow and flourish than to wither and die in the decades ahead."[2] Decentralization of decision-making provides a climate of individual responsibility, authority, and dignity which encourages the growth and development of creative talents and which in turn, results in great improvement in the firm. His view of decentralization, rather than the more narrow concept that decentralization offers nothing more than centralized managerial control over smaller and more dispersed units, will be even more applicable when the new information technology is brought to bear. The new technology will improve the basis of human decision-making rather than making it more routine and mechanical.

However, it is not the intent of this paper to carry the pro and con

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[1]Harold J. Leavitt and Thomas L. Whisler, "Management in the 1980's" Management Systems, Peter P. Schoderbek (New York: John Wiley and Sons, Inc., 1967), p. 79.

[2]John F. Burlingame, "Information Technology and Decentralization" Management Systems, Peter P. Schoderbek (New York: John Wiley and Sons, Inc., 1967), p. 87.

arguments of this dichotomy of thinking to conclusion, but rather to briefly demonstrate that future technology, at least as far as our present horizons permit us to foresee, will not diminish the constantly expanding decentralization trend. It is, then, entirely proper to continue exploration of the many facets of the decentralized firm.

The humanistic benefits of decentralization, both to the firm and to the individual, were a later development of the concept rather than the factors which precipitated it.

> The underlying cause of corporate decentralization is complexity of operations. This complexity is reflected in longer lines of communication, more numerous decision variables, and greater heterogeneity of products, processes and contributory activities. Under these conditions, several problems tend to arise in centralized organizations:
> 1. The decision maker is removed from close contact with daily operations, leading to slower decisions and requiring heavy traffic communications lines.
> 2. Top management lacks the time to evaluate the large quantities of relevant data and the numerous variables that must be considered when all important decisions are made centrally.
> 3. Lower-level executives lose contact with the ultimate profit objective of the firm, and this may lead to inappropriate decision rules at lower levels.
> 4. Subordinate management tends to become specialized in the various functional areas, which may hinder the development of replacements for top executive positions in which a comprehensive viewpoint is necessary.
> 5. The employee's vision of his own importance to the organization tends to become obscured and morale suffers.[3]

Gordon Shillinglaw cited these problems as the reasons that many companies have turned to a profit-center decentralization form of operation. This quasi-independent form of organization forces the middle manager, the manager of the division, to sharpen his managerial skills in

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[3]Gordon Shillinglaw, "Divisional Performance Review: An Extension of Budgetary Control" Management Controls: New Directions in Basic Research, ed. by Charles P. Bonini, Robert K. Jaedicke and Harvey M. Wagner (New York: McGraw-Hill Book Company, 1964), pp. 149-50.

adopting a broader frame of reference.[4]

Given, then, that the decentralized form of organization has many advantages and considering that it is popularly found in industry today, we need to study, gain a working knowledge, and improve, if possible, on the management techniques utilized with this type of organization.

Limitations

It is frequently found that large decentralized firms are organized into separate autonomous divisions. It also frequently happens in such divisionalized firms that products, including raw materials, semi-finished, or finished goods, are transferred between divisions for further processing or for direct sale. Under these circumstances, two techniques have emerged that have especially facilitated the measurement of the performance of the respective divisions.[5] One of these involves the use of some form of profit or rate of return on investment to directly measure performance. The other, transfer pricing, is the dollar amount or sales price charged the sister division for goods transferred.

It will be the intent of this research project to study certain aspects of performance measurement of such divisions. Since profit making is the paramount reason for a firm's existence, it logically follows that some quantitative form of profit measurement would best serve to indicate relative success, or failure, of the division operation and, consequently, its manager. The transfer price, analagous to the market price in open

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[4]William H. Newman, Charles E. Summer and E. Kirby Warren, The Process of Management (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1961), pp. 76-77.

[5]Charles T. Horngren, Accounting for Management Control: An Introduction (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1965), p. 297.

market competition, directly limits the profit the selling division will generate on the transfer or "sale" of goods. It is obvious that an equitable method of transfer pricing is essential if any form of profit is to be utilized as a measure of performance.

The measurement techniques must, obviously, be designed to properly motivate the manager. That is, they must direct his efforts so that the goals of the overall firm are maximized. They must also provide a realistic measure of the results achieved by the manager. These two techniques, rate of return on investment and transfer pricing as they relate to the motivation of the manager and the measure of his performance, will be the subjects of the balance of this paper.

Research Questions

It is anticipated that the following research questions will be explored:

1. How significantly do return on capital investment and transfer pricing relate to measurement of divisional performance?

2. Why should return on capital investment and transfer pricing be singled out in the measurement of divisional performance?

3. How is divisional performance measured by return on capital investment?

4. What are the methods of extablishing an intracompany transfer price, and once established, how does it contribute to measurement of divisional performance?

Organization

Chapter II will more fully define the divisional form of organization and will set the stage for the research effort in the subsequent chapters.

Chapter III will more fully explore the transfer price problem and will consider the various methods currently employed. It will include the disadvantages of each method and the contributions of each toward performance measurement and motivation of the division manager.

Chapter IV will review the popular methods of making capital acquisition and investment decisions and will relate them to a program for performance measurement to replace or to augment the rate of return techniques.

Chapter V will summarize the results of the research effort and draw pertinent conclusions thereon.

Methodology

The methodology utilized in the research for this paper included library research. Available literature abounds with the basic precepts presented herein. In fact, the many sources located were found to be largely repetitive in the concepts presented concerning divisional performance and transfer pricing.

CHAPTER II

DIVISIONAL PERFORMANCE EVALUATION

Every enterprise is subject to a performance evaluation in some manner or form. The independent entrepreneur is measured in terms of customer satisfaction. Big business is measured in terms of its earnings reflected in the price earnings ratio of its common stock. Growth companies are measured by the growth in earnings per share, or growth in dividend yield by those stockholders more interested in income. Within a firm the most commonly used form of performance indicator is some variation of profit return or rate of return on assets employed.

Divisionalized Firm

A divisionalized firm is one that is split up into product or regional divisions, each of which has full responsibility for its own profit or loss. Essential in this arrangement is that all the major operations necessary to make a profit are grouped under the manager of each self-sufficient unit. Further, the management of these units is so highly decentralized that each of them is semi-autonomous. The system operates as a network of little businesses within the parent firm. The manager has most of the resources and much of the freedom of action that he would enjoy if he were president of an independent company. He, in turn, is expected to take whatever steps are necessary to make a profit.

Most diversified companies use some variation of this form of divisionalized organization.

A major advantage of profit decentralization is its effect on the motivation of the division manager and his top level supervisors. They can make key decisions concerning their division and subsequently see the results of their efforts. The profit-and-loss statement of each operating division provides a significant measure of results since all the relevant activities are under the direction of the division manager.[6]

In a divisionalized firm, as in all other types of business, it is desirable to have a means for motivating those responsible for the management of the division in a direction that is to the overall benefit of the firm. It is also desirable to have a system whereby the resulting performance of those managers can be measured in terms that express the managers' contribution to the goals of the firm. Various indicators have been suggested and used to accomplish these ends, but the more meaningful, at least for a profit oriented firm, include some form of profit measurement. The more common forms of measurement include profit contribution, return on investment, or residual income. Applying these measures in divisions that sell exclusively in outside markets is relatively simple. Sales or transfers between divisions, however, raise the question of equitable distribution of the total profit between the divisions involved. The relative distribution among divisions is most important to the division managers since it will, in divisions that so transfer a significant portion of their production, largely determine their profit and consequently their performance measure by higher management.

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[6]Newman, Summer and Warren, Process of Management, pp. 74-80, passim.

Transfer Price

As was briefly alluded to in the introduction, the transfer price is the value placed on goods produced by one division of a multidivision industrial complex and then transferred to another division of the same firm for additional processing or for sale. The transfer price thereby becomes a significant single item in determining the shipping and receiving divisions relative profit, their performance measure and, consequently, to a large degree the motivation of the managers involved. It may also have an influence on management decisions concerning make or buy, selecting production possibilities and, possibly, whether to keep producing at all. Transfer price policies must neither impinge unduly on executive time nor interfere with overall company goals. Motivation is the overriding consideration that should influence management in using performance measures. Above all, the system and techniques utilized should induce managers to act in ways that support rather than conflict with top management's goals.[7]

There are many methods in active use for determining a transfer price. Chapter III will be devoted to a review of the more common methods of transfer pricing in use. For each method the advantages and disadvantages will be brought out to determine the probable effect of the method on the motivation of the manager, and to determine its effect on the rate of return as an indicator of performance. We will be looking to see if each method accomplishes the following tasks:

> first, the guidance of the division or other internal managements whose results are being measured, and second, the assistance of top management and its staff in their tasks of appraising and guiding divisional performance.

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[7]Horngren, Accounting for Management Control, p. 306.

In this regard, then, two basic questions will be considered for each method.

> (1) Does it assist division management in making business decisions in ways that will maximize the company's profits? (2) Does it give top management a reliable summary of the financial record of each division's performance?[8]

A familiar strain running through most of the recent literature concerning performance measurement is that the system must motivate the individual manager such that his decisions are in harmony with, and directed toward the accomplishment of the over-all company goals. It has been well established that the prime objective of most firms is to make a profit for the owners or investors. Further, some form of return on investment measure has been established as the most significant measure of a manager's performance. However, there is an inherent danger in using this yardstick in that overemphasis can result in a manipulation of figures or in a concentration on profits over the short run for a single division but at the expense of long range profits for the overall firm. On the other hand the division might, with the full approval of top management, spend money on advertising to improve its market position. It may spend huge sums over a period of years in the development of a new product. During such time the division might be showing a small return yet putting itself in a more favorable position for future growth and earnings. Conversely, the division could make a good short run profit by keeping down expenses for certain deferable items, but slip in customer good will or product development in the interim. It appears, then, that the use of profit for control purposes is valid only if it is interpreted with a full

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[8]Joel Dean, "An approach to Internal Profit Measurement," Contemporary Issues in Cost Accounting: A discipline in Transition, ed. by Hector R. Anton and Peter A. Firmin (Boston: Houghton Mifflin Company, 1966), p. 281.

understanding of what is happening in the division. In fact, Horngren suggests that

> Overemphasis of high rates of return may actually hurt long-run profits, because too high a return invites new competetion. A company may deliberately lower its rate of return in order to preserve or enhance its long-run share of the market.[9]

This seems almost too conservative, but Professor Horngren is a noted scholar and writer and is probably correct in his observations. He further suggest that firms judge their divisional managers by other measures in addition to return on investment. He lists share of the market, efficiency or productivity, product leadership, employee attitudes, public responsibility, personnel development, and balance between short and long range goals.[10]

Supplement or Replace Rate of Return

There is little question that these and other similar indicators can be utilized to measure the various narrow sub-specialties of a manager. However, as most writers are quick to point out, the profit or rate of return indicator remains supreme over the long haul as the single most important measure. Rate of return in its many variations, though, is an after-the-fact measure when it is utilized as a post performance reporting indicator. If the rate of return over the measurement period falls considerably below standard, the division may already be in serious trouble and higher management may find itself with no alternative but to replace the division manager and with the task of revitalizing the division in question. It would seem appropriate to have a measure or

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[9]Horngren, Accounting For Management Control, p. 302.

[10]Ibid., p. 293.

measures that could be applied much earlier in the accounting period, and not only prevent significant failures such as the aforementioned but also to guide the manager in his major decisions as they occur so that the division might be even more profitable in the long run. It is suggested that current thinking and practice in the field of capital investment can be utilized to demonstrate a program for measuring the division manager's performance on an as-occuring-basis. Once again the rate of return techniques have proven to be the most realistic and comprehensive tools available to management. Application of rate of return techniques to capital investment decisions facilitates establishment of yet another tool. That is, the results of the analysis made for capital investment purposes can be retained and used as a milestone against which the actual or post performance results are compared. Such a comparison permits a measure of planning as well as performance expertise.

Review and approval of major capital expenditures is a function, recognized by most authors, to be retained by top management. It is during this review that the aforementioned performance milestones can be established. Chapter IV will explore the more common of these investment decision criteria in an attempt to relate them to a series of performance indicators suitable for post performance analysis. It is expected that the following areas will be considered:

1. Leverage
2. Optimum capital structure
3. Payback period
4. Proceeds per dollar of outlay
5. Average annual proceeds per dollar of outlay
6. Average income on the book value of the investment

7. Annual capital charge method
8. Yield method
9. Net present value method
10. Net present value method with earnings constraint
11. Profitability index
12. MAPI formula

CHAPTER III

INTRACOMPANY TRANSFER PRICE

Internal transfer prices are an important factor in performance evaluation. This is painfully obvious to the division manger whose performance is being measured and who might be the victim of an arbitrarily established transfer price that favors the sister division. Several methods may be used to establish the price used to account for internal transfers. The selection of an appropriate method depends at least in part on management's objectives in using such prices and partly on the merits of the different pricing schemes. For the purpose of this paper and as indicated in earlier chapters, two prime considerations will be made in the review of each method. (1) Does it properly motivate the division manager? That is, does it assist division management in making business decisions in congruence with the overall goals of the firm, or in this case, does it maximize the firms long range profits? (2) Does it give top management a reliable indicator of the true financial performance record of the division?

In this regard the following transfer pricing methods will be reviewed.

1. Market price method
2. List price method
3. Discounts from list price method
4. Wholesale price method
5. Base-period cost plus profit method

6. Budgeted cost plus profit method
7. Absorption cost method
8. Factory cost method
9. Variable cost method
10. Negotiated price method

Unfortunately, each method has limitations as well as advantages which makes it extremely difficult for a company to select a "best method" for its purposes. An attempt will be made to underscore these advantages and disadvantages as they relate to the aforementioned criteria.[11]

Market Price Method

The market price method involves transfer of goods at a value or price equivalent to that prevailing in the open market. It is the price that the receiving division would have to pay outsiders. It is an opportunity cost. Some writers speak of it as the price that would be obtained through arm's length bargaining between the receiving division and an outside supplier.

This method is used extensively in the oil industry. The crude oil is charged to company refineries at the going market rate, regardless of where purchased. Transportation billing is likewise based on published Interstate Commerce Commission pipeline and tanker charter rates even if affiliated companies provided the transportation service.[12]

It should be added that the market price method in practice takes into account the various discounts and deductions available to a buying firm.

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[11]Morton Backer and Lyle E. Jacobsen, Cost Accounting: A Managerial Approach, (New York: McGraw-Hill Book Company, 1964), p. 417.

[12]A. D. Kaplan, Joel B. Dirlam and Robert F. Lanzillotti, Pricing in Big Business (Washington, D.C.: The Brookings Institution, 1958), p. 80.

That is to say, the market price, in effect, establishes only a ceiling for the transfer price. In fact, it can rarely be applied to internal transfers without adjustment. The quantities transferred often are substantial, resulting in cost economies to the supplier. Some form of volume discount is therefore warranted. Normally, market price includes provision for recovery of advertising, sales promotion, selling commissions, credit and collection, and other costs which are not incurred with intracompany transfers. These costs, therefore, should be excluded. If internal transfers are made directly from the supplier's plant, the cost of warehousing should also be excluded from the transfer price. Financial discounts offered to outside market customers should also apply. These various adjustments are frequently applied by expressing each in percentage form, calculating and deducting them from the going market price to determine the actual transfer price.[13] The following example illustrates such an application:

	Percent
Market Price	100.0
Less:	
Volume discount	2.0
Advertising and sales costs	15.0
Credit and collection costs	1.0
Warehousing costs	2.0
Financial discount	2.0
Total deduction	22.0
Transfer Price (percentage of market price)	78.0

When there is an existing market price it generally represents the most desirable basis for establishing a transfer price, at least where some

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[13]Horngren, Accounting for Management Control, pp. 305-306.

form of profit measure is to be used to judge performance.[14] The market price method is difficult to challenge. It enables the divisions to operate almost as though they were completely separate entities except for the guiding hand of top management that can be brought to bear should a division manager make irrational decisions that would adversely affect the overall corporate goals. The motivational incentives of this type of virtually independent operation can, perhaps, only be exceeded by that provided by a completely independent firm. The yardstick for measuring the manager's performance, his profit contribution to the overall profitability of the firm, closely parallels that for an independent firm. The method facilitates the division managers retaining full profit responsibility for their divisions. It appears, then, that the market price method fully contributes to the motivation of management and fully supports performance measurement requirements of the divisionalized firm.

List Price Method

The list price method of intracompany transfer price determination is nothing more than the previously described market price method. Writers using the term say that it involves using the same prices for trade and intracompany sales. Once again the method is heralded as the most defensible basis of intracompany pricing. The buyer is paying prices which are just as low as those charged to favored customers. The seller is receiving the same income that he would receive if he sold the same products to outside customers. Further, the buyer is paying prices which are at least as low as he would pay if he bought the products on the open market. Disagreements on intracompany prices are virtually eliminated.[15]

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[14]Backer and Jacobsen, Cost Accounting, p. 421.

[15]I. Wayne Keller and William L. Ferrara, Management Accounting for Profit Control (2nd ed.; New York: McGraw-Hill Book Company, 1957), p. 624.

Discounts From List Price Method

The discounts from list price method is another variation on the market price scheme. It applies where goods are sold locally as well as being transferred to other units which also sell them in other markets. The other units are charged a discounted list price. Discounts take into consideration such items as cash discounts and freight allowed to regular customers of the producting unit. They consider also the distribution expenses that would normally be experienced in outside sales.

Some authors describe essentially this same system under the heading of "market price". Without the applicable discounts, they point out, the buying unit has little incentive to purchase from a sister division at market price, other things such as quality, delivery schedules and other factors being equal. Recognizing that certain cost advantages do accure the selling unit, they continue, a discount is proper and it provides the necessary incentive to buy in house.[16]

The determination of the applicable discount to the buying unit is very similar to the example given above for discounts and deductions to market price. A more detailed treatment here would be redundant.

Wholesale Price Method

Solomons makes reference to organizations that use wholesalers who serve as outlets for the manufactured products. Transfers are effected to these wholesalers at normal wholesale prices. This, again, is a variation of the list price or market price method by another title and will therefore, not receive further treatment herein.[17]

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[16] Ibid., p. 625.

[17] David Solomons, Divisional Performance: Measurement and Control (Homewood, Ill.: Richard D. Irwin, Inc., 1965), p. 176.

Base-Period Cost Plus Profit Method

The base-period cost plus profit method utilizes cost and capital employed at a given moment in time, but not necessarily coincident with the accounting period. Profit is based on a pre-established percentage of the base period cost. Changes to costs, prices of raw materials, and wage and salary rates, may be cause for adjustment of the transfer price and may therefore be passed on to the receiving division. Gains or losses due to production methods or efficiencies are charged to the producer at least until the base-period cost base is revised. Hence, his profit is not guaranteed. Yet, on the other hand, he can make expenditures for cost reduction items or effect other efficiencies to increase his profit without passing any part of these savings along to the buying division as can be seen in exhibit number one. The producing division has automated a significant portion of his operation. He has purchased a $12,500 machine that reduced his direct labor cost by one-third. The machine is depreciated at a rate of $1,000 per year. The total unit cost is reduced by $0.10 per unit. This savings is offset by the additional profit generated on the additional capital investment which results in a net increase in profit for the producing division of $0.10 per unit, rather than any cost reduction being passed along to the buyer.

Another disadvantage of this method is that the producer can load the costs or value of capital employed at the time the transfer price is established, thus giving himself easily attainable excess profits and putting the buyer at a competitive disadvantage. A recurring problem concerns the timing for review and subsequent change of the base cost or capital employed. The buyer will want to maintain a competitive position in his market while the seller will want to maximize his profit.

Unit standard costs:	Manual System	Automated System
direct material	$ 1.00	$ 1.00
direct labor	.60	.40
variable factory overhead	.40	.40
Total variable cost per unit	$ 2.00	$ 1.80
Fixed factory overhead	$12,000	$13,000
Administrative expense	4,000	4,000
Total fixed costs	$16,000	$17,000
Fixed cost per unit (volume-10,000 units)	1.60	1.70
Total unit cost	$ 3.60	$ 3.50
Capital employed:		
cash	$ 3,000	$ 3,000
inventories	7,000	7,000
property, plant, equipment	15,000	27,500
Total capital employed	$25,000	$37,500
Established return on capital employed - 8%	$ 2,000	$ 3,000
Profit per unit for 8% return	0.20	0.30
Total Intracompany Transfer Price	$ 3.80	$ 3.80

Exhibit 1.--Transfer price, base-period cost plus profit method.

The buyer, if his profit is suffering, will attempt to get the costs and base period reviewed whenever he can demonstrate reasonable doubt as to their validity. The producer, on the other hand, will naturally resist any such efforts unless, of course, they are in his favor. Decisions, then, will be division oriented rather than company oriented.[18]

In summary, the base-period cost plus profit method, by its very nature, contains considerable margin for inequities. The original base-period cost can be faulty if the producing unit loads the cost base purposely, inadvertantly, or if the producer is just plain inefficient. Once the base is established, the producing unit can effect cost reduction savings without passing any reduction to the buyer. On the other hand, significant valid cost increases will penalize the producer until such time as a new base can be established. In an environment where a new base can be readily established there is little incentive for the producing unit to minimize costs and the firm as an entity will suffer as a result.

This method should not be employed if profit is to be a measure of performance since the likelihood of a valid base for profit is questionable. Even if this problem were solved, the method guarantees the supplier, at least in regard to internal transfers, a stipulated profit or rate of return on capital. Yet, these are indices of performance that management is trying to use to measure performance.[19] Further, with the exception of short run efficiencies or savings for which the producing unit can take credit, motivation of each division manager to expand his profit will be at the expense of the sister division. Also, the producing division manager

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[18]Keller and Ferrara, Management Accounting, pp. 627-29.

[19]Backer and Jacobsen, Cost Accounting, p. 420.

would not be motivated to lower costs under his control since his performance is not measured by this yardstick. In short, the method provides neither a sound profit performance measure nor a positive motivational force.

Budgeted Cost Plus Profit Method

The budgeted cost plus profit method, sometimes called cost plus a markup method, bases the transfer price on the budgeted cost of the seller plus a predetermined rate of return. The profit percentage is set by company policy. It is normally based on average rate of return of the buying unit, the firm as a whole, or on some fixed rate such as a predetermined return on capital invested. This method of computing the transfer price is also demonstrated by the example in the previous section "base-period cost plus profit method." The basic difference between the two is that the budgeted cost plus profit method utilizes the accounting period to determine costs rather than using values that exist at some given time as under the base period method.

This method provides little incentive for the producing unit other than meeting its own cost standards and fixed expense budgets since the rate of profit is guaranteed and the volume is determined by the buyer. Further, if the producing unit should beat its standards and budgets, so that it will equal or exceed the return on capital which is established by the intracompany trading policy, the achieved efficiency will be reflected in the standards for the next budget period and will, consequently, be passed on to the buying unit in all future periods. There is little motivational influence to become efficient. In fact, the seller may be inefficient, he may be operating at a low fraction of capacity, or his cost records may be padded. Since these costs, as improper as they may be,

are passed along to the buyer along with any permanent increases in material, labor, and other costs, there is little incentive for the seller to minimize them. In fact, higher costs will yield higher apparent profits for the producing division since profits are a percentage of cost. The higher profit would be at the expense of the buyer and subsequently the customer in the market place. Conversely, since cost savings would yield lower total profit there is little hope for innovation under such a method.[19]

As in the previously discussed method, since profit is computed on a fixed percentage of cost, top management obviously cannot use profit as a performance measure. Particularly since profit is directly proportioned to costs, any form of profit measurement would serve to negatively motivate division managers into increasing costs, or at least influence him not to decrease them.

Obviously, lower costs combined with other factors would have to serve as value indicators of performance under this system. This in turn would promote innovation, efficiency and other efforts toward cost reduction and, consequently, greater total profit for the firm. It would, however, then be a cost method form of transfer price similar perhaps to the following.

Absorption Cost Method

The absorption cost method is similar to the aforementioned budgeted cost plus profit method, except in its detailed accounting techniques and its exclusion of a profit markup.

The method has the minor advantage of being readily usable for external reporting of inventories since profits are excluded. The disadvantages are numerous. The revenue potential of the products being

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[19]Keller and Ferrara, Management Accounting, pp. 626-28.

transferred is not reflected. Consequently, the income of the supplying division will be understated at best, and nearly non-existant if a significant portion of his output is so transferred. Conversely, the receiving units potential profit will be abnormally high.

The selling division's performance cannot be measured by its profit or rate of return since the proportion of its total output that is transferred to the sister division, at no profit, may vary from period to period. The profit could thus be uncomparable with other similar industries or with previous years for the division. Cost reduction would necessarily provide the only valid monetary measure of performance and the manager would have to be so motivated.

The receiving division could use profit as a performance measure since it controls the quantity of cost based input it receives. Its return might not be comparable with other similar industry, but might be compared with its own historical record. Further, the manager would operate somewhat in an independent business environment with its inherent motivational forces, albeit with his high profit advantage.[20]

Factory Cost Method

The factory cost method is nearly identical to the absorption cost method. It is normally used when there are no requirements for performance or profit measurement by the units concerned. If standard costs are used, transfers are made at the standard cost with variances being charged to the producing unit. If standards have not yet been developed, actual costs are frequently used as a transfer price.

The use of actual costs may result in inefficiencies being passed along to the buyer, a constant cause of disagreement between the divisions.

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[20]Backer and Jacobsen, Cost Accounting, p. 419.

However, if costs were also used as a basis for performance measurement of the producer, it would negate the problem somewhat and provide the motivation necessary to minimize costs to the benefit of the producer, the receiver, and the firm overall.

Profit can be used to measure performance of the receiving unit, but only to the degree as was discussed in the absorption cost method. However, keep in mind that as with the absorption cost method, use of factory cost as a transfer price can upset the profit and performance measurement of subsequent units in the chain. A subsequent unit that is measured will attack costs, whether actual or standard, if its performance is not up to expectations and if it has no direct control over the costs. This is especially apparent where actual costs rather than standard costs are used as a transfer cost.[21]

Variable Cost Method

The variable cost method utilizes the variable cost of the producing unit as a transfer price. To this the receiving division adds its variable cost to establish a minimum selling cost. The ultimate selling price establishes the marginal contribution for the combined divisions.

As can readily be seen, the method is grossly unfair to the producing unit as it affects its profit performance indicator. The goods so transferred not only do not provide any increment of profit, but they even fail to provide a contribution toward the fixed costs of the producer. The suppliers only monetary performance measure, at least on the transferred portion of his output, is reduction of variable costs. Unless an extremely small proportion of his total output is so transferred, profit return is not a valid performance indicator.

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[21] Keller and Ferrara, Management Accounting, pp. 629-30.

The receiver should be motivated nearly to the degree of an independent operator. He controls input and all other factors except the producers variable costs. As in the earlier examples, his performance can readily be measured by his total profit contribution, if not with similar firms, at least with previous years performance. The validity of this indicator again depends on the proportion of his total output that was so received and the stability of this proportion over successive evaluation periods.[22]

Negotiated Price Method

As the name implies, the negotiated price method involves negotiation between the buying and selling units to determine an equitable transfer price. Keller and Ferrara in the application of this method say, "In the absence of published list prices, negotiation results in the most equitable intracompany prices." It should be noted that their description of list price is identical to the definition and use of market price by other authors. Presumably the price that is determined by such arm's length bargaining is one upon which the seller and buyer are willing to do business. Each must consider the same factors that he would in making a purchase or sale outside of the firm giving due consideration to whatever performance measure is used to evaluate his division.

Perhaps the negotiated price method is the most equitable in the absense of a market price. Nevertheless, it does have certain drawbacks. For example, either the buyer or seller may bargain from a more advantageous position. One may have outside market flexibility while the other may not. Whatever the reason, the agreed price may be unfavorable to the weaker division, adversely affecting both his long range performance measure and

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[22]Backer and Jacobsen, Cost Accounting, pp. 419-420.

certainly his motivation. This method may divert attention away from the overall firm to the individual division's welfare. For instance, if outside business is bad there may be a tendency to make it up on fellow executives. Negotiations may turn out to be time consuming or inflamatory, and top management may find it necessary to serve as arbitrator in the resolution of differences. The method will, at the minimum, require the time of a higher executive to establish policies so that the prices, once established, are not brought up again for review too frequently. Throughout the arbitration process and in establishment of such policies, the higher executive is, in effect, assuming at least to some degree the profit responsibility of the negotiating parties.[23]

In consideration of the disadvantages, Horngren's conclusion is in sharp contrast to that credited earlier to Keller and Ferrara. He concludes,

> When market prices are not available as a foundation for negotiations, the resultant transfer prices are artificial to a point which severely limits the significance of rate of return or other measures of performance.[24]

He reminds us that the whole idea of decentralization and of profit centers is based on the freedom and independence of the division managers. Both he, and later Backer and Jacobsen, add the stipulation that the buyers must have alternatives in that they must be permitted to buy and sell outside the company structure if the negotiated price method is to be utilized successfully.[25]

In summary it can be stated that all conditions being optimum, it would appear that the negotiated price method can certainly be applied

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[23]Keller and Ferrara, Management Accounting, p. 625.

[24]Horngren, Accounting for Management Control, p. 307.

[25]Backer and Jacobsen, Cost Accounting, pp. 421-22.

successfully. However, it is very evident that the method permits considerable margin for inequitable results. Where these inequities exist any form of profit measure for performance can be rendered completely useless. Not only may top management find itself without valid performance indicators, but an inordinate amount of top management's time may be taken up in policy making and arbitration. Further, motivation of the division managers could be misdirected against the other division to the detriment of the firm's overall goals.

Now, some authors predicate the success of the method upon having a valid market price, or list price if you prefer, to use as a base for negotiations. Although none of the authors went into such detail, it is assumed that the negotiations would then center around such items as volume and financial discounts given outside buyers and normal costs that are normally applied in determining the sales price to an outside firm are more fully treated in the Market Price section earlier in this chapter. Their discussion of this method seems somewhat inconsistent in that the availability of a valid market price is stated as a prerequisite for determination of an equitable negotiated transfer price. Yet, every writer consulted is in complete agreement with the concept that only the market price serves as a utopian transfer price in that it supports determination of valid profit performance indicators, and, it in no way detracts from the ultimate motivational forces inherent in the decentralized divisionalized form of organization. Why negotiate if you already have a valid markot price?

The Transfer Price Summary

In the beginning of this chapter it was stated there are several methods for use in the determination of a transfer price. It is now

obvious that the various methods can be categorized into three broadly based types as follows:

1. Market Based
    a. Market price method
    b. List price method
    c. Discounts from list price method
    d. Wholesale price method
2. Cost Based
    a. Base-period cost plus profit method
    b. Budgeted cost plus profit method
    c. Absorption cost method
    d. Factory cost method
    e. Variable cost method
3. Negotiated price method

The various pricing methods grouped as market based offer the only scheme that adequately meets the criteria established for this study. That is, this type alone assures that the division managers are properly motivated toward a goal congruence of the divisions and the firm overall. It alone permits full utilization of profit and the variations of rate of return as valid measures of performance. The method permits the division managers to retain full profit responsibility for their divisions. When appropriate discounts are applied, to compensate for cost not incurred through in house transactions, it closely parallels operation of an independent firm, the utopia of divisionalized organizations.

The second basic type of transfer price includes the many variations of the cost based method. These variations are in common use today. They are understandable and convenient for the people that must make use of

them. When they result in prices reasonably close to actual market prices, they are practical, convenient, clear, and fair.[26]

This is true, however, only if valid performance indicators are applied. For example, none of the variations is applicable if profit is used as the value indicator of performance except for the division that eventually sells the goods on the open market, and even then performance cannot always be compared with similar industries, but frequently only with prior year's performance of the same division. Further, excess costs whether real or imagined, are a constant source of disagreement between the divisions. Consequently, much more of top management's time is required to administer this method. Also, in instances where the producing division is selling on the open market, product mix can be adversely affected. Resources may be turned to outside profit sales rather than to products for the sister division which is in a position to generate even greater profit for the firm overall.[27]

Intermediate producing divisions must be measured on effective management of controllable costs. These costs must be subjected to competitive comparisons to ensure that excess costs are discovered. The method can thus be successfully used by directing the division manager's actions toward goal congruence, i.e. overall profitability of the firm.

However, the method is still second best when compared to market price since it does not fully support the concept of divisionalized firm where the manager has full responsibility for invested capital, cost,

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[26]Horngren, Accounting for Management Control, p. 305.

[27]Howard C. Greer, "Divisional Profit Calculation-Notes on the Transfer Price Problem" Contemporary Issues in Cost Accounting: A Dicipline in Transition, ed. by Hector R. Anton and Peter A. Firmin (Boston: Houghton Mifflin Company, 1966), p. 291.

and revenue and where performance can be realistically measured by a rate of return.

The third and final category of transfer price, the negotiated price method, is probably the poorest system of those considered. It encourages disagreement on every factor that enters into the transfer price since bargaining successes are entirely at the fellow executive's expense. It follows that the method would require more of higher management's time than either of the other types, both in settling disputes and in preventing frequent renegotiations. Profit measurement is not necessarily accurate since apparently healthy profits may be at the expense of the other division. Motivation may also be entirely misdirected since there may be as much incentive to work against a sister division as toward a corporate goal. In fact, with either negotiated or cost methods the resulting transfer prices are artificial to a point which severly limits the significance of rate of return or other measures of performance.[28]

It has been concluded that the negotiated price method should only be utilized if a market price is not available and only then if the divisions are given complete freedom to buy and sell on the open market. Under these conditions, where each manager can operate with complete independence, the method can prove eminently successful.

Now, Greer points out that

> no available transfer-price scheme is likely to serve all possible purposes equally well, and that the results of any method employed must be interpreted with a clear conception of its limitations.[29]

The advice appears sound and our first broad category of transfer price in

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[28]Horngren, Accounting for Management Control, p. 307.

[29]Greer, Divisional Profit, p. 293.

use today seems to most adequately meet our requirements.

The market price method and its variations, virtually eliminates the possibility of manipulations of the transfer price by division managers. It almost assures goal congruence of the divisions and the firm as an entity. It maximizes motivation of the division managers concerned, and it provides the only measure of performance that incorporates all the factors that affect profit. It appears to be the utopian transfer pricing method just so long as it is available. Again Greer tells us, "Unhappily the applicability of the method is severely limited by the absence of dependable market price quotations on a majority of industrial products." He continues by citing many examples where market prices may not be available or at least may be undependable. These include situations where the item may be unique or peculiar with only limited or restricted trading. He indicates that actual sales may not be dependable since quantities and time factors might play an important part in the eventual price. In such situations he recommends:

> (a) let judgements on profitableness be made, and implemented, exclusively by top management . . . ; (b) develop other criteria for evaluating and motivating divisional management performance.[30]

The previous analyses particularly on the negotiated price method and various cost based methods supports this approach.

By way of final analysis, it has been concluded that the market price, or one of its variations, should always be used whenever one is available. Further, it is considered that the negotiated price method should not be used. It is said to be valid only if the managers have the freedom to purchase either in house or on the open market. But if this situation exists, a market price should also exist and should, therefore, be used.

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[30] Ibid., p. 294.

If not, as Greer suggests, use other criteria to judge profitableness and to motivate the managers. Such an application of other criteria would permit utilization of any of the cost based methods to determine a transfer price.

However, if the producing division transfers a significant portion of its output with a cost based transfer price applied, we need to develop suitable criteria for measuring the division's performance since any attempt to utilize profit or rate of return would result in unrealistically low values. Chapter IV will explore an approach to this problem.

CHAPTER IV

RETURN ON CAPITAL INVESTMENT

Perhaps the major advantage of the rate of return techniques is the focus on a sometimes neglected phase of management responsibility, that is, the assets or investment that is being utilized to generate the profit being made by the firm or the division. The importance of the assets being used, or capital investment base as it is frequently called, is readily apparent when one looks at the formulas in common use to measure the rate of return.

Rate of return= Asset turnover x Net margin percentage on sales

where:

$$\text{Asset Turnover} = \frac{\text{Sales}}{\text{Total available assets (the capital investment base)}}$$

and:

$$\text{Net margin percentage of sales} = \frac{\text{Net operating income before interest and income taxes}}{\text{Sales}}$$

or:

$$\text{Rate of return} = \frac{\text{Net operating income before interest and income taxes}}{\text{Total available assets}}$$

It can readily be deduced from the above that the rate of return will be affected by any activity in the following areas:

1. Increase or decrease in sales
2. Increase or decrease in total available assets
3. Increase or decrease in costs
4. Changes in any of the above coupled with disproportionate changes in one or both of the other areas.

This chapter will concentrate on the second of these areas, the capital investment base.

Capital Investment

The management of capital investment may very well be the most important of a manager's functions. Decisions that affect other executive performance indicators such as market share, efficiency or productivity, product leadership, attitudes and the host of others are each important in their own sphere. Yet, the firm can still make a profit, even if not the maximum possible, without being maximized in all of these areas. To some degree, for example, inefficiencies can be made up by strengths in other areas. This is not the happy situation where capital investment decisions are involved. If poor decisions are made in this area, no amount of increased sales effort or cost reductions, for example, can obviate an inadequate or poorly structured investment base. It is for this reason that the capital investment area has been singled out for consideration.

At this juncture it is probably advisable to establish just what is meant by the capital investment. The capital we speak of in this instance includes long term obligations both debt and equity. Equity, of course, is the amount of capital provided by the firm's real owners, the holders of common stock. Debt includes long term notes, debentures and mortgage bonds.

To the private individual attempting to balance his household budget, the word debt usually connotates something ominous. Conversely, to the corporation's financial manager, debt, at least when we speak of debt capital, usually signifies the cheapest form of funds available to him.

The agreement between the firm and the bond or debt holders is for a given capital sum generally loaned for a fixed period. The debt holder will receive a predetermined amount of annual interest. Or, as it is sometimes stated, the firm sells a proportion of its income as a prior charge to the debt holders in return for a stated capital sum.[31] Since debt holders are guaranteed a specific return, assuming the firm is a going concern, their demand for return is less than that of the equity holders. Hence, it is the cheaper cost of capital to the firm. There are other advantages to the firm including the tax deductible feature of debt interest, and, during periods of inflation or economic growth of the country the burden of debt capital decreases correspondingly. These advantages accrue to the equity holders, as well as to the firm itself.

Leverage

Even more important to the equity holders is the feature known as leverage. The use of cheaper debt capital actually multiplies the rate of return to the stockholders. The effect can readily be seen in the following illustration:

Levered firm		Unlevered firm
$100	Gross Earnings	$100
10	less interest	-
90	Before taxes	100
45	Less Taxes at 50%	50
$ 45	Common Stock Earnings	$ 50

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[31] A. J. Merrett and Allen Sykes, The Finance and Analysis of Capital Projects (New York: John Wiley and Sons, Inc., 1963), p. xiii.

Return on Equity:

$$\frac{45}{800} = 5.6\% \qquad \frac{\text{Earnings}}{\text{Common Stock Equity}} \quad \frac{50}{1000} = 5\%$$

$$\frac{\text{Levered Return}}{\text{Unlevered Return}} = \frac{5.6\%}{5\%} = 1.12$$

In the foregoing example both firms utilized a total capital structure of $1000. In the levered firm debt financing accounted for $200 of the total structure at 5% interest. The results demonstrate that the equity holders are better off by a factor of 1.12 or their earnings are 12% greater.

It might seem that the obvious answer would be to formulate a capital structure almost entirely with cheap debt money and the few of us who were fortunate enough to hold common stock would be levered into millions. Unhappily, this approach is not valid. As debt increases, additional funds sources become increasingly scarce because of the greater risk of the firm not being able to meet the accumulating total debt. Investors not being willing to loan capital at low rates where high risk exists, will withhold from investing any more capital. Only increased interest rates will entice them further.

Optimum Capital Structure

There is a point at which an optimum capital structure exists, that is, there is an optimum mixture of debt and equity capital that results in a lowest possible cost of combined capital. At this optimum balance a change in the ratio of debt capital to equity capital, which ratio has been defined as leverage, will result in a higher overall cost of capital to the firm. The computations consider the different rates of interest, the quantities of each type of capital, and the effect of income tax.

A series of related computations is necessary to effectively obtain the optimum overall cost of capital.

Since equity capital is normally the larger source used by industrial firms, it will serve as a good starting point. Two broad sources need to be considered. First, we can consider external sources, or those where additional capital is obtained through the sale of common stock. The formula in common use follows:

$$Ke = \frac{Ea}{P}$$

where:

Ke = after-tax cost of capital

Ea = anticipated future earnings without the additional capital

P = net proceeds or $ per share actually received by the firm as a result of the existing stock issue

Applying appropriate values, the formula gives a percentage cost of capital from the common stock, or equity, source. The rationale behind the formula is that any new investment must benefit the owners at least equal to their expected return on the existing structure. The anticipated earnings divided by the net proceeds results in the appropriate cost of capital.[32]

In this and subsequent examples, space will not be taken to demonstrate actual numerical examples since it is not intended that this paper substitute for a text. An attempt will be made, however, to relate the use of these formulas to performance measurement of a division.

Cost of capital obtained through the sale of preferred stock will be considered next. Although preferred stock is more appropriately debt capital than equity capital, it is treated here since the method is

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[32]Ezra Solomon, The Theory of Financial Management, (New York: Columbia U. P., 1963), p. 51.

substantially the same as the previous example. In this instance the stated dividend rate is payable as long as the stock is in circulation. The dividend is not tax deductible so the following formula again yields an after tax cost.

$$Kp = \frac{D}{P}$$

where:

Kp = the after tax cost of preferred stock

D = stated annual cash dividend amount per share

P = net proceeds or $ per share actually received by the firm from the issue

Again applying appropriate values will give us an after tax percentage cost of capital from the preferred stock, debt, source. The rationale associated with this formula is that cost to the firm is the annual dividend payment. This in turn is applied to the net proceeds or the amount of funds actually made available for use to the firm. The net proceeds are the market price less any costs associated with the sale of the stock.

The next condition to be considered is that of a growing firm which experiences dividend payments on its common stock as well as earnings. In this instance the following formula is normally applied:

$$Ke = \frac{D}{M} + g$$

where:

Ke = after-tax cost of common equity

D = latest dividend per share

M = market price at time of dividend declaration

g = growth or expected rate of increase in future dividends

Again, appropriate values will give us an after tax cost of capital. As

can be seen the formula provides for the current cost by the D/M ratio as well as a growth cost g.

Cost of debt is an equally simple calculation. The formula commonly in use follows:

$$Ki = \frac{I \pm d/n}{(P + M)/2} \times (1 - T)$$

where:

Ki = after-tax yield of the bond to maturity

I = total $ annual interest payment

d/n= $ amount of discount or premimum added or subtracted from the annual interest payment to determine effective annual payment

(P + M)/2 = average of net proceeds and face value to incorporate the average amount of funds available

(1 - T) = 1 - T (or tax rate) adjusts to give us the after tax cost

The formula thus provides for stated interest, discount or premimum if any, and tax affect.

Once the cost of capital for each of the different kinds of financing has been established, it is a relatively simple matter to compute an overall effective cost or weighted cost, as it is frequently called, of the capital structure. The following formula is normally used:

$$Ko = \frac{Ke(E) + Kp(P) + Ki(B)}{E + P + B}$$

Where:

Ko = after tax weighted cost of the capital structure

Ke = after tax cost of common equity

Kp = after tax cost of preferred stock

Ki = after tax cost of bonds

E = total value of common equity

P = total value of preferred stock

B = total value of bonds

By weighting the various types of capital, a more nearly actual cost is determined.

This very basic and somewhat lengthy overview of the steps leading to a determination of the cost of a firm's effective capital structure will set the stage for a later analysis.

After a determination of the effective cost of a firms existing, or proposed, capital structure it is a simple matter to recompute the cost for higher or lower financial leverage ratios. It will immediately become apparent whether future financing should consider debt or equity capital, or perhaps both if the desired capital adjustment is sufficiently large.

So much for the workings of the financial manager in his attempts to obtain capital necessary to operate and expand the firm at a most equitable or minimum cost. It would seem that being engaged in a search for indicators of performance, here is one that is very basic yet of extreme importance.

Rate of return, as was indicated earlier, is an excellent indicator of performance since it includes a consideration of the capital employed and it measures the single most important product to the owner, that of profit. It does create difficulties, as was seen in chapter III, where a significant portion of a firm's or division's output includes a fixed profit or no profit as was the case with certain transfer pricing schemes commonly in use. Further, and perhaps most important, it is applied at the end of the accounting period at which point poor performance may have

already done irreparable damage to the firm. Also, it is all too encompassing including all the indicators of performance that go into overall profit. The actual reasons for a poor rate of return may be difficult to determine. It seems that even an apparently healthy rate of return may be misleading. Who is to say that the return could not have been considerably more generous?

In searching for quantitative performance indicators to supplement the rate of return approach, it is considered that formulas and analyses similar to those reviewed earlier concerning optimum capital structure could be periodically examined, particularly prior to new financing, to determine the manager's level of proficiency in the development of capital sources and subsequent management of capital. Could this not help to obviate a later poor showing, or conversely, could it not help to insure that subsequent rate of return is maximized?

Admitedly, this single measure would only be singularly significant. It would be meaningless to attempt to measure performance of a division, subsidiary, or firm that has little or no capital structure of its own to manage. However, similar tools commonly used by the financial manager might very well be used as indicators of performance in other specialized areas, all of which contribute to the eventual rate of return. Perhaps a few or many of these could be selectively applied that would materially contribute to rate of return or that would at least insure that major contributors to rate of return are not overlooked in daily management. It will be the intent of the balance of this chapter to review many of these common tools in an effort to determine the validity of this approach.

Payback Period

The payback period calculation as it is applied to a proposed capital

investment is, perhaps, one of the most popular tools available. This is probably because of its simplicity and easy application. It involves subtracting each years income from the original capital outlay to determine the number of years required to amortize or pay off the outlay. From a financial management standpoint, it has serious weaknesses. Most important it does not include recognition of any income beyond the payback period. The manager would not know from this method whether the investment will make any profit or merely amortize itself.[33] Further, it gives no recognition to the time value of money in that it does not consider the fact that to a businessman a dollar today is worth more than a dollar sometime in the future.

However, in some types of business where product or equipment obsolescence is a significant factor the payback period might well be an important check or safeguard. In such an atmosphere, why should the manager not be measured by this technique?

The following additional tools will next be discussed:

1. Proceeds per dollar of outlay
2. Average annual proceeds per dollar of outlay
3. Average income on the book value of the investment

The first is nothing more than the total expected income divided by the total investment. The second method is identical except it uses the total proceeds divided by life of the project, or average annual proceeds figure, as the numerator. Neither of these methods is very useful to the financial manager because they do not recognize the time value of money in addition to other less significant weaknesses. Neither appears to provide a useful measure of performance and will, therefore, not be treated

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[33]James T. S. Porterfield, Investment Decisions and Capital Costs (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1965), pp. 10-11.

further herein. The third method is nearly identical in that it uses the average annual income divided by the book value. This method is said to be used by analysts frequently as a measure of efficiency and should, therefore, deserve further consideration.[34] Using book value limits the usefulness of the results somewhat depending on the method of depreciation in use. Using the total investment cost instead, by not subtracting depreciation, and eureka!, our old friend the rate of return on investment reappears. The method however, is not useful to the financial manager for investment purposes since it also fails to consider time value of money in addition to other faults.

The next series of financial management tools that will be considered are those which do recognize the time value of money and are thus rapidly gaining favor in the business world because of the more accurate or more nearly real world picture they present. All of these are popular approaches to the problem of establishing a relative ranking of projects in terms of the return on the amount to be invested. They thereby assure that the most productive projects are selected and that no project or investment is undertaken which does not return the rate desired by management and, ultimately, the stockholder.

Annual Capital Charge Method

The annual capital charge method is one of the more simple methods to understand and apply. It is, however, limited to those investments which yield a relatively stable or uniform annual cash inflow. The object of the method is to determine whether the annual net cash inflow is adequate to

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[34]Harold Bierman, Jr. and Seymour Smidt, The Capital Budgeting Decision: Economic Analysis and Financing of Investment Projects (New York: The Macmillan Company, 1966), pp. 22-25.

offset annual depreciation and carrying charges associated with the investment. The method is normally used by firms that use the sinking fund method of depreciation to provide for redemption of capital. Those firms are normally financed by debt capital.[35]

Yield Method

The yield method, or rate of return method as it is frequently called, involves determining the annual net cash inflows and outflows and then discounting the series, to some degree by trial and error, at successive compound interest rates or discounts until the discounted inflows equal the discounted outflows. The interest rate that accomplished the balance is the yield or rate of return on the investment. "Discounting is characterized by the fact that it proceeds from future to present, inversely, with the passage of time."[36]

Net Present Value Method

The net present value method requires discounting the net cash inflows and outflows at a predetermined interest rate or rate of return, probably the after tax cost of capital of the firm, and then comparing the results. If the present value of the inflows is greater than that of the outflows, the investment receives further consideration. These later methods do entail some difficulty in estimating cash inflows and outflows, yet unless investments are to made by seat-of-the-pants methods, these estimates are

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[35]Merrett and Sykes, Finance and Analysis of Projects, pp. 39-40.

[36]Pierre Masse', Optimal Investment Decisions: Rules for Action and Criteria for Choice (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1962), p. 11.

mandatory. The net present value method includes provision for depreciation and its effect on income taxes. By assigning lower present values to flows that are further into the future, it also assists in overcoming the inaccuracy of longer range forecasts.[37]

Before the discounted cash flow methods are allowed to stand as the utopian tool, it seems that reasons for its slow acceptance should be considered. In 1965 it was stated

> a recent study indicates that of 163 companies selected from the Fortune list of 500 companies, less than half employ the DCF . . . discounted cash flow . . . approach.[38]

Two reasons are given for this fact. (1) There is a lack of understanding about projecting cash flows more than a few years into the future. (2) Risk-conscious decision makers with strong liquidity perferences desire to utiliże payback bench marks. Lerner and Rappaport illustrate a situation where the use of the highly touted DCF techniques may actually result in a negative growth in earnings per share, EPS, over a short period. The situation involves a hypothetical firm with fifteen projects of varying lives. The authors proceed with normal DCF calculations and show which projects would subsequently be selected. They then demonstrate how, over the next five year period, earnings per share will fluctuate and even become negative for one year. This condition in turn raises the possibility that investors may, through a lower multiple, actually cause a lower market price for the firms stock. Because of this possibility, they emphasize, companies with multiple financial objectives have indicated

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[37]John A. Griswold, More for Your Capital Dollar (Hanover, N. H.: The Amos Tuck School of Business Administration, Dartmouth College, 1957), p. 1.

[38]Alexander A. Robichek and John G. McDonald, Financial Management in Transition, (Menlo Park, California: Stanford Research Institute, 1965), p. 7.

future levels or growth in EPS as their prime financial objective more often than any other measure.

They proceed with the development of an approach that includes the constraint that the earnings of a company must grow at some stipulated and constant rate. In so doing, the growth picture improves by a different selection/rejection of projects than the DCF procedure would dictate. However, it is significant to note that the overall present value becomes lower than that obtained utilizing the DCF approach. Recognizing this, the authors suggest a middle road approach, but again caution that their example amply illustrates one reason why the discounted cash flow technique has not received wider acceptance in the financial community.[39]

This variation on the discounted cash flow technique was included to demonstrate once again that the real world problems do not always fit exactly the textbook situations. It was not considered necessary to include the complete rigorous solution provided by the authors but, rather only a brief overview to accomplish this end.

Profitability Index

The profitability index is an outgrowth of the preceeding methods. It is nothing more complicated than the discounted cash inflows divided by the discounted cash outflows, or, present values of inflows over outflows if one prefers. It is a relative worth indicator. A positive number indicates a favorable project with the larger numbers indicating generally

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[39]Eugene M. Lerner and Alfred Rappaport, "Limit DCF in Capital Budgeting" Harvard Business Review, (September-October, 1968), pp. 133-39, passim.

greater rates of return.[40]

From the financial managers point of view only the net present value method and the yield method adequately meet the criteria for establishing a reasonably accurate method to meet real world situations.[41] These criteria are:

1. Recognize the time value of money.
2. Include all cash flows, inflows and outlays.
3. Discount all cash flows.

The annual capital charge method, being only useful where constant cash flows occur, is not considered sufficiently versatile. Further, in some situations even the yield and net present value methods give conflicting guidance. Normally " . . . the present-value method tends to give better decisions."[42]

For the purposes of this paper it is not necessary to probe deeper into the yield method versus net present value method. The interested reader can refer to Bierman and Smidt[43] or Porterfield[44] for a more exhaustive analysis.

MAPI Formula

Professor Buffa demonstrated the application of the MAPI formula that is in common use in investment decisions concerning production line

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[40]Robert N. Anthony, Management Accounting: Text and Cases (Homewood, Illinois: Richard D. Irwin, Inc., 1964), pp. 636-37.

[41]George A. Christy, Capital Budgeting: Current Practices and Their Efficiency (Eugene, Oregon: Bureau of Business and Economic Research, University of Oregon, 1966), p. 61.

[42]Bierman and Smidt, Capital Budgeting Decision, p. 39.

[43]Ibid., pp. 39-52, passim.

[44]Porterfield, Investment Decisions and Capital Cost, pp. 32-37, passim.

equipment. Instead of providing a rate of return over the life of a project the MAPI formula only gives us an initial rate of return. Equipment obsolescence is provided for by the use of tables giving different rates of decline in value. The MAPI charts account for straight-line, sum-of-years-digits, or double declining balance methods of depreciation. The formula includes net investment, the following years operating advantage, the next-years capital consumption avoided as well as incurred, and the resulting next-year income tax adjustment. The figure produced by the formula is an urgency rating that can be compared to similar ratings of other proposed investments. Obviously the method could only be successfully applied where equipment obsolescence is a major factor since the method gives only the first-year adjusted rate of return.[45]

Application of Techniques

Once again let me refer back to the basic formula for performance measure:

$$\text{Rate of return} = \frac{\text{Net operating income before interest and taxes}}{\text{Total available assets}}$$

It is obvious that the techniques explored in this chapter thus far encompassed only two areas, albiet extremely important areas, in the performance formula. That is capital acquisition and capital utilization. The techniques used to determine cost of capital affect nearly all aspects of management's responsibilities since nearly every management decision involves a cost consideration. Every decision, therefore, should weight the expected benefits against the total cost including the cost of the capital required. The cost of capital techniques coupled with capital investment techniques come into play whenever proposed management action

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[45]Elwood S. Buffa, Modern Production Management (New York: John Wiley and Sons, 1965), pp. 121-127, passim.

may affect the firms capital assets structure. Such decisions are among the most important for which a manager must assume responsibility. Mistakes in these decisions can easily be fatal for the firm. These are the basic make-or-break choices that frequently offer only one chance.[46] Because of their strategic nature and their far reaching effect on shareholders and management, since future prosperity of the firm is dependent upon the success of new undertakings, utilization of these techniques as a part of an overall package for evaluating management performance is considered valid. That is to say, since profit, or rate of return, is not a valid instrument to measure performance of those divisions whose output includes a significant quantity of product for a sister division, and for which there is not a suitable transfer price, then the techniques herein described can adequately substitute, at least in part, for such a performance indicator.

For example, for a larger firm, probably of conglomerate proportions, that extends capital acquisition as well as utilization responsibilities to its division managers, the techniques in use for determining the optimum capital structure can double as indicators of financial performance. The actual cost of capital could be redetermined by higher management to coincide with each accounting period. This actual figure could be compared with the cost of capital figure that was used by the division being evaluated in making its capital investments during the period. The comparison would provide a measure of the ability of the division management to forecast and subsequently to manage its capital acquisition program. Should top management prefer a more centralized approach, these comparisons could be

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[46]Ray I. Ruel, "Profitability Index for Investments", Harvard Business Review (July-August, 1957), p. 117.

made as part of top management's approval sequence prior to permitting the division to undertake any significant change in the existing capital structure. Further, any form of capital acquisition with which the division manager has been entrusted can be measured by the application of the described techniques such as:

1. Equity or common stock source capital cost
2. Preferred stock source capital cost
3. Internally generated capital cost
4. Debt, other than short term, capital cost

Applicable techniques can be utilized in determining the weighted overall cost of capital.

In summary, then, these as well as any other formulas or techniques in use by the firm to make its acquisition decisions should properly be used again after the fact with data generated through experience to measure the planning expertise as well as performance of the division management. Utilization of such practices encourages those responsible for planning to be more realistic since, in effect, their performance or ability to forecast accurately is also being measured.

Much the same philosophy of measurement can be applied to capital utilization or investment decisions. Again, the same techniques in use to make the initial decision can be reapplied later, but with actual experience data to measure the actual goodness of the earlier decisions. Of course, each of the various techniques has its strengths and weaknesses, but these can be recognized in the weight that top management gives to the individual technique in the overall performance measurement program. For example, the payback period was shown to be only applicable in an environment where rapid obsolescence is an overriding factor and quick

recovery of investment is paramount. Consequently, use of this technique for investment decisions is generally limited to a comparison of recovery times only. However, the following example will demonstrate an expanded use of the technique to include a planning and performance measurement application.

Say, for example, that from a list of investment proposals a firm had elected to undertake a project with a payback period of three years. In making this determination the investment manager would have had to determine the total cash outlay for the project and the corresponding stream of cash inflows. For illustration, assume the cash outflow totaled $7,000 and cash inflows included $3,000 in year one, and $2,000 per year for the subsequent four years. By the end of year three the $7,000 outlay will have been returned thus indicating a payback period of three years. The $2,000 inflow during years four and five will represent the overall anticipated profit on the project and would have been one of the determining factors in selecting this project over others with a similar payback period.

Now, for performance and planning measurement purposes, actual cost data would be collected and compared with the above for each accounting period. Say at the end of year one the actual cash outlay had totaled $7,500 due to unforseen installation difficulties and the income stream was now $4,000 in year one, with $3,000, $2,000, and $1,000 over the following three years. At first glance it might appear that planning had been conservative and that actual performance had bettered the original plan since the payback period now appears to have been reduced to about $2\frac{1}{4}$ years. On the other hand the cash outlay was greater and the accumulated inflow now appears to be less with the total profitability reduced from an estimated $4,000 to about $2,500. Applying one of the

more realistic discounted cash flow techniques might show that the actual rate of return is greater for the latter situation depending on the discount rate applied. At the very minimum, the latter situation indicates an earlier return of capital and profit which in itself is advantageous.

It will not add materially to the intent of the analysis to carry this discussion further since subsequent reporting and analysis would proceed in the same manner. It should suffice to indicate that this type of periodic reporting and analysis based on the original investment decision would serve to demonstrate planning expertise and performance of the division in question.

The proceeds per dollar of outlay, average annual proceeds per dollar outlay, and average income on the book value of investments methods were all considered improper for capital investment decisions since they included no provision for the time value effect on money. However, if management still chooses to utilize one of the methods, it should use the same method to evaluate its performance. In fact, in so doing it might become painfully aware of the significance of the time element.

The rationale for using the annual capital charge method is much the same as the aforementioned, but keeping in mind the inherent limitation of this method. It is only applicable where the yield or return is relatively stable.

The next three methods considered were all eminently applicable for use in capital investment decisions.

1. Yield method
2. Net present value method
3. Net present value method with earnings constraint

Each had certain advantages in investment decisions, but these are not

considered relevant for measurement purposes. The methods are applicable to both profit-maintaining as well as profit-augmenting projects. That is, they are equally applicable to projects for replacement of existing assets, and improvement to meet competition, as well as projects that will provide for new business and greater profits.[47] The same method should be used as an after the fact performance measure as was used for the basis of the initial investment decision. Since the time value of money is incorporated into these techniques, the actual performance should more nearly compare to the planned. It should also lend credibility to the technique making large variations from planned less easy, perhaps, to explain.

Periodic reporting and subsequent analysis based on discounted cash flow techniques would proceed much the same as that outlined above for the payback method. Using the yield method, for example, the estimates of net cash outflow, inflow, and the resulting rate of interest or discount, as computed for the investment decision, would all be retained for future comparison with actual results. At the end of each accounting period actual outflow and inflow compilations along with updated estimates of future inflows would again be discounted to obtain an updated rate of return.

Once again the updated results would be compared with the estimates originally used as the basis for the investment decision to indicate how accurately division management is forecasting and how well it is performing. Subsequent years reports would probably be compared with all previous years reports in addition to the original analysis to permit a more realistic appraisal of current trends. Periodic reporting and analysis utilizing the other investment decision techniques included herein would also proceed along similiar lines and would prove redundant if discussed further.

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[47] Ibid., p. 119.

The profitability index technique seems to have little value as a performance indicator since only total net cash inflow and outflow are utilized. However, the mechanics of the technique, net present value method, are utilized to determine the totals. Consequently, they can again be utilized as a comparison for performance purposes.

The MAPI formula can also be utilized. However, as was determined earlier, it is only applicable for a single year's consideration. Its use is therefore limited to measuring the validity of the method for this limited time frame.

It would seem that the techniques used to make decisions in the other facets of total assets management could also be employed as performance indicators. For a relatively complete coverage of overall asset management indicators would need to be applied, or perhaps developed, for the following:

1. Current assets
    a. Cash
    b. Marketable securities
    c. Accounts receivable
2. Inventory management
    a. Finished products
    b. Work in progress
    c. Raw materials

Factors for measurement of land management and physical facilities or structures should also be included where applicable to the divisions.

An evaluation program that includes all or nearly all of the above areas could provide a suitable measure of the "total available assets" portion of the rate of return formula. Likewise, a similar set of

techniques and standards to measure the various factors that go into the "net operating income before interest and income taxes" portion would facilitate measurement of performance in the other half of the rate of return computation. These would include value indicator measures of sales, costs, and expenses. The measure of sales performance could properly be extended to less quantifiable facets as market share and product leadership. It is recognized that if all of these areas of management responsibility could be readily measured, we would have the complete rate of return measurement. But, once again keep in mind that the object herein is partially to develop a complex of performance measures to properly evaluate those divisions who transfer significant portions of their output to sister divisions without the benefit of a market based price. Under these constraints, a complete and equitable rate of return is not available. The proposal is to utilize as many of the aforementioned techniques as can readily be applied and develop these into a performance measurement program.

Since each of these indicators will not be equal in importance to the firm, a weighted system would seem appropriate. For example, in the narrow but important area of current assets management, cash represents one-sixth, receivables one-half, and inventory one-third of working capital in American business according to 1966 figures estimated by the Securities and Exchange Commission.[48] Obviously they should not be treated equally in determining weights for the various performance indicators. Each firm, then, must develop its own system of indicators and weights applicable to its business.

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[48]Edward J. Mock, Robert E. Schultz, Raymond G. Schultz and Donald Hart Shuckett, Basic Fincancial Management: Text, Problems, and Cases, (Scranton, Penn.: International Textbook Company, 1968), p. 102.

The resulting schedule of weighted factors could be further developed into a base for bonus or incentive type motivation plans. The more common plans in use provide for a percentage of salary or some fixed amount as a bonus for exceeding a pre-established target. Further, incremental or percentage increases beyond target generally earn a greater fixed amount or higher percentage of pay bonus.[49] Such a bonus plan could easily be adapted to the recommended performance measurement program. Targets could be established for many of the areas being measured with either percentage or fixed quantity overages as the basis for bonus payments. Other incentive devices would be equally adaptable.

It is considered that with such a program, most of the important contributing factors to rate of return could be measured. Further, whatever motivational benefit results from bonus or other intentive type plans could also be achieved with the proposed program. Since the major contributors to rate or return are so measured, the program is believed to be second best only to a full rate of return measurement. However, it has the advantage that at least a few of the measurements, those concerning capital management, would be on an as occuring basis so that if top management should find it necessary to intervene, action could be taken immediately rather than some time after the termination of the accounting period. The division management would be constantly aware that its planning would meet the acid comparison with actual results. This would insure that maximum attention was given to forecasts, and planning in general.

It might be argued that review by top management in the detail described would largely obviate the motivational benefits that normally

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[49]Horngren, Accounting for Management Control, pp. 302-03.

accrue from the divisionalized, decentralized form of organization. It is submitted that top management should only intervene if the indicators show questionable performance. In this regard, the program facilitates timely action. If, as should be the case, the division management performs according to expectations top management should maintain the hands off attitude associated with this form of organization.

It is considered that such a program would provide for performance measurement of a division significantly engaged in the transfer price problem.

CHAPTER V

CONCLUSIONS

In chapter I it was determined that the decentralized form of organization would probably remain as a strong and viable force in the business world. It followed that continued exploration of the many facets of the decentralized firm is entirely proper.

For the purposes of this paper exploration was limited to performance measurement techniques applicable to divisions that assumed profit and investment center responsibilities. In this regard, certain basic research questions were asked. In this final chapter the research questions will be reviewed and conclusions drawn from the research will be presented. Additional findings will also be included where applicable.

Research question number one:

How significantly do return on capital investment and transfer pricing relate to measurement of divisional performance?

Available literature abounds with the virtues of using the return on capital investment as the singularly most useful and meaningful measure of performance of a profit making firm. The measure did, however, prove to be unusable for a division engaged in significant quantities of product being transferred to or from sister divisions. This was particularly so if the quantities so transferred varied erratically in successive accounting periods. Chapter IV set out to devise a program of performance

indicators that could adequately substitute for the rate of return technique under these constraints.

Transfer prices were also found to significantly relate to performance measurements in that they, in effect, established a ceiling on the amount of profit or markup that a division was able to generate on its product. This ceiling was equally restrictive to both the buying and selling divisions. In fact, where the transfer price was based on other than market price, it completely obviated using the performance measurement techniques noted earlier.

Research question number two:

Why should return on capital investment and transfer pricing be singled out in the measurement of divisional performance?

This question was largely answered with the previous one. It should probably be repeated that the return on capital investment measurement is all encompassing in that it includes a measurement of the primary product of the firm, its profit, against the capital that was employed to do the job. Further, the transfer price was of little consequence unless a division was engaged in significant quantities of goods being transferred and then only if a market based price was either unavailable or improperly applied.

Research question number three:

How is divisional performance measured by return on capital investment?

Shortly after research was undertaken it was determined that this question was too basic, being adequately treated in much the same manner by every author consulted. After it was determined that the return on

capital investment technique was not applicable in certain transfer price situations, it was considered to be more pertinent to explore alternative measurement devices that could provide a method for application in such situations. Chapter IV reviewed some such devices and recommended a series of performance indicators from which a performance measurement program could be developed as applicable to each firm.

The discussion included proposals for incorporating bonus plans or other incentives into the program.

Research question number four:

What are the methods of establishing an intracompany transfer price, and once established, how does it contribute to measurement of divisional performance?

No fewer than ten methods were investigated with the result being the emergence of the following three basic types:

1. Market based
2. Cost based
3. Negotiated

Only the first group adequately met the criteria established for this research project.

The contribution of the transfer price to measurement of divisional performance was treated in question one. It could be added that the transfer price also negatively contributed in some instances since the cost based and negotiated methods obviated the use of standard profit and rate of return techniques under the circumstances described earlier.

From the above it is painfully obvious that the research questions were generally poorly selected. There is noticeable overlap in at least three areas.

However, the research proceeded well beyond the original limitations in attempting to establish a supplemental performance measurement after it had been determined that the rate of return techniques were not universally applicable. In so doing, no new or startling discoveries were made or techniques devised but the research effort considerably broadened the writer's understanding of the techniques included herein.

SELECTED BIBLIOGRAPHY

Books

Anthony, Robert N. Management Accounting: Text and Cases. Homewood, Illinois: Richard D. Irwin, Inc., 1964.

Anthony, Robert N.; Dearden, John; and Vancil, Richard F. Management Control Systems: Cases and Readings. Homewood, Illinois: Richard D. Irwin, Inc., 1965.

Anton, Hector R., and Firman, Peter A. Contemporary Issues in Cost Accounting: A Discipline in Transition. New York: Houghton Mifflin Company, 1966.

Backer, Morton, and Jacobsen, Lyle E. Cost Accounting: A Managerial Approach. New York: McGraw-Hill Book Company, 1964.

Bierman, Harold Jr. and Smidt, Seymour. The Capital Budgeting Decision: Economic Analysis and Financing of Investment Projects. New York: The Macmillan Company, 1966.

Bonini, Charles P.; Jaedicke, Robert K.; and Wagner, Harvey M. Management Controls: New Directions in Basic Research. New York: McGraw-Hill Book Company, 1964.

Buffa, Elwood S. Modern Production Management. New York: John Wiley and Sons, 1965.

Burlingame, John F. Information Technology and Decentralization. Management Systems, Peter P. Schoderbek. New York: John Wiley and Sons, Inc., 1967.

Christy, George A. Capital Budgeting: Current Practices and Their Efficiency. Eugene, Oregon: Bureau of Business and Economic Research, University of Oregon, 1966.

Cohen, Jerome B., and Robbins, Sidney M. The Financial Manager: Basic Aspects of Financial Administration. New York: Harper and Row, Publishers, 1966.

Dean, Joel. Capital Budgeting: Top Management Policy on Plant, Equipment, and Product Development. New York: Columbia University Press, 1951.

Dean, Joel. "An Approach to Internal Profit Measurement." Contemporary Issues in Cost Accounting: A Discipline In Transition. Edited by Hector R. Anton and Peter A. Firmin. Boston: Houghton Mifflin Company, 1966.

Greer, Howard C. "Divisional Profit Calculation - Notes on the Transfer Price Problem." Contemporary Issues in Cost Accounting: A Discipline in Transition. Edited by Hector R. Anton and Peter A. Firmin. Boston: Houghton Mifflin Company, 1966.

Griswold, John A. More for Your Capital Dollar. Hanover, New Hampshire: The Amos Tuck School of Business Administration, Dartmouth College, 1957.

Horgren, Charles T. Accounting for Management Control: An Introduction. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1965.

Johnson, Robert W. Financial Management. Boston: Allyn and Bacon, Inc., 1962.

Keller, I. Wayne; and Ferrara, William L. Management Accounting for Profit Control. 2nd ed. New York: McGraw-Hill Book Company, 1957.

Leavitt, Harold J.; and Whisler, Thomas L. "Management in the 1980's". Management Systems, Peter P. Schoderbek New York: John Wiley and Sons, Inc., 1967.

Masse', Pierre. Optimal Investment Decisions: Rules for Action and Criteria for Choice. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1962.

Merrett, A. J.; and Sykes, Allen. The Finance and Analysis of Capital Projects. New York: John Wiley and Sons, Inc., 1963.

Mock, Edward J.; and Schultz, Robert E.; Schultz, Raymond G.; and Shuckett, Donald Hart. Basic Financial Management: Text, Problems, and Cases. Scranton, Pennsylvania: International Textbook Company, 1968.

Newman, William H.; Summer, Charles E. and Warren, E. Kirby. The Process of Management. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1961.

Porterfield, James T. S. Investment Decisions and Capital Costs. Englewood Cliffs, New Jersey: Prentice-Hall, Inc. 1965.

Robichek, Alexander A. and McDonald, John G. Financial Management in Transition. Menlo Park, California: Stanford Research Institute, 1965.

Schillinglaw, Gordon. "Divisional Performance Review: An Extension of Budgetary Control." Management Controls: New Directions in Basic Research. ed. by Charles P. Bonini, Robert K. Jaedicke and Harvey M. Wagner. New York: McGraw-Hill Book Company, 1964.

Solomon, Ezra. The Theory of Financial Management. New York: Columbia V. P., 1963.

Solomons, David. Divisional Performance: Measurement and Control. Homewood, Illinois: Richard D. Irwin, Inc., 1965.

Weingartner, H. Martin. Mathematical Programming and the Analysis of Capital Budgeting Problems. Chicago: Markham Publishing Company, 1967.

Magazines

Lerner, Eugene M. and Rappaport, Alfred. "Limit DCF in Capital Budgeting" Harvard Business Review. September-October, 1968.

Reul, Ray I. "Profitability Index for Investments". Harvard Business Review. July-August, 1957.

Reports

Kaplan, A. D.; Dirlam, Joel B. and Robert F. Lanzillotti. Pricing in Big Business. Washington, D. C.: The Brookings Institution, 1958.

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